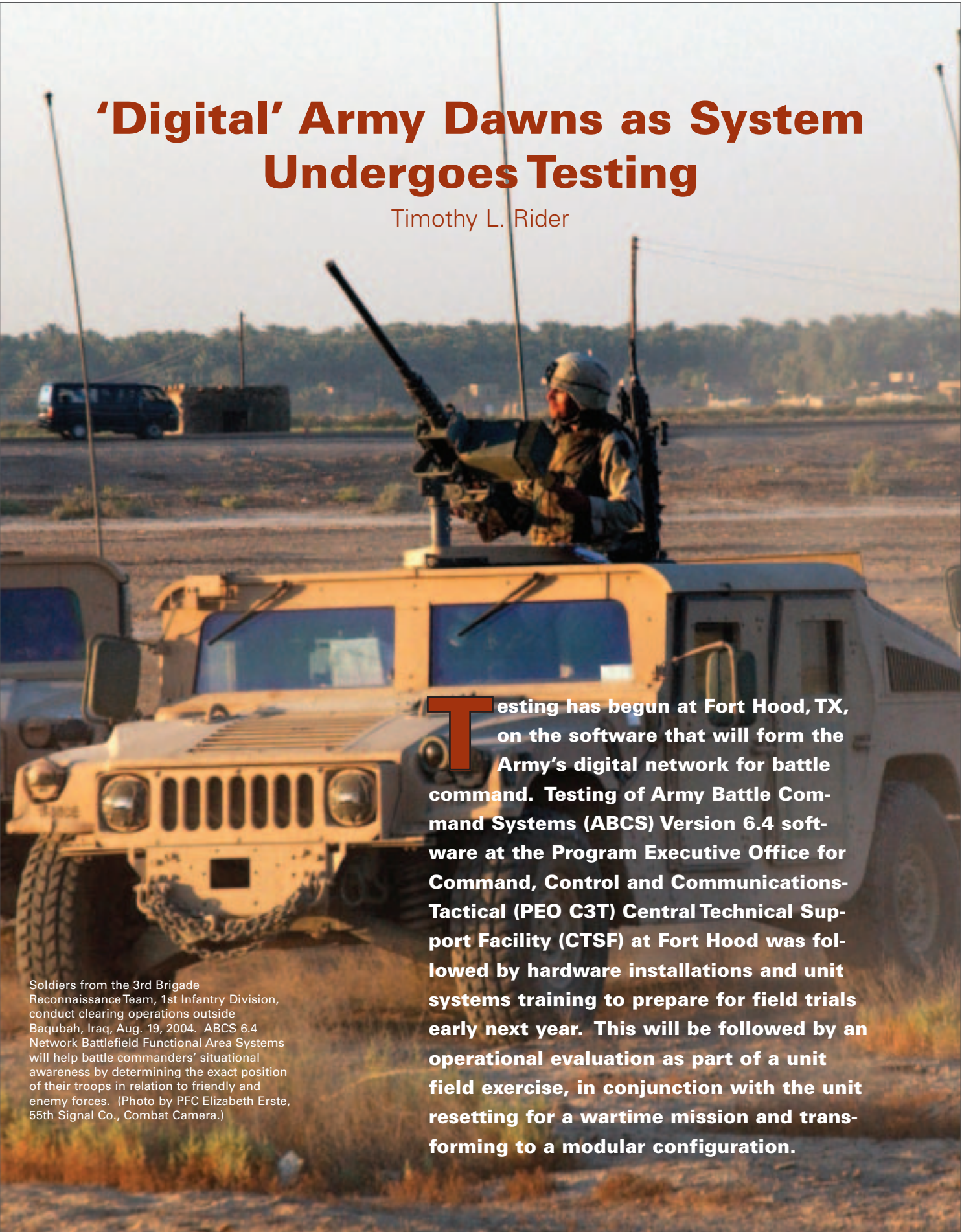


'Digital' Army Dawns as System Undergoes Testing

Timothy L. Rider



Testing has begun at Fort Hood, TX, on the software that will form the Army's digital network for battle command. Testing of Army Battle Command Systems (ABCS) Version 6.4 software at the Program Executive Office for Command, Control and Communications-Tactical (PEO C3T) Central Technical Support Facility (CTSF) at Fort Hood was followed by hardware installations and unit systems training to prepare for field trials early next year. This will be followed by an operational evaluation as part of a unit field exercise, in conjunction with the unit resetting for a wartime mission and transforming to a modular configuration.

Soldiers from the 3rd Brigade Reconnaissance Team, 1st Infantry Division, conduct clearing operations outside Baqubah, Iraq, Aug. 19, 2004. ABCS 6.4 Network Battlefield Functional Area Systems will help battle commanders' situational awareness by determining the exact position of their troops in relation to friendly and enemy forces. (Photo by PFC Elizabeth Erste, 55th Signal Co., Combat Camera.)



“With our Army fighting a war, keeping the peace, deterring aggression, providing humanitarian assistance around the globe and undergoing major transformation, it is clearly not business as usual,” remarked COL Harold Greene, the Army Program Manager for Ground Combat Command and Control Systems and “trail boss” for the ABCS 6.4 program.

“Our goal is to have ABCS 6.4 certified early next year and then field it to the entire Army with priority going to units slated for deployment to Iraq and Afghanistan,” Greene continued. “The Chief of Staff of the Army directed we field ABCS 6.4 to the Active Army and all rotating units within 4 years. We’ll fill out the remaining units following that.”

“ABCS 6.4 enables information dominance and the focus is on fielding a ‘good-enough’ capability now to deploying units, and spiraling technology in as it becomes available,” Greene explained. “Further spirals down the road can include Joint mission planning, Joint

An infantry Soldier from the 1st Battalion, 5th Cavalry Regiment, dismounts from a Bradley Fighting Vehicle during a cordon and search mission in White Gold Village in Baghdad, Iraq, April 20, 2004. (U.S. Army photo by PFC Bryan D. Kincade.)

and coalition interoperability and collaborative enhancements as we move toward the future battle command. Technology will spiral in from the Future Combat Systems program as well as Joint programs.”

Program completion will make the Army a fully digital fighting force with all combat units operating with a new version of the digitally networked operating environment already familiar to Soldiers in the 4th Infantry Division (4ID), 1st Cavalry Division and Stryker Brigade Combat Teams (SBCTs). Delivery of ABCS 6.4 includes communications gear, computers, ancillary items, new software or software upgrades. Generally, units will receive training when the equipment or upgrades are provided.

“Soldiers using ABCS 6.4 will see analog tactical operations centers (TOCs) characterized by acetate-covered paper maps replaced with digital TOCs with computer-generated displays,” explained Carol Wortman, Lead Software Engineer for the Maneuver Control System for the U.S. Army Communications-Electronics Command at Fort Monmouth, NJ. “What Soldiers see in a digital TOC will be just the front-end of a complex system,” Wortman continued. “Behind the computer screens lies a network with tentacles reaching out to much of the information, combat power and support within a theater of operations.”

“ABCS 6.4 will help Soldiers connect,” Greene said. “It provides a capability to plan and coordinate actions very rapidly. The network also extends into the Joint realm so it’s possible to coordinate more closely with the Air Force, Navy and Marines during all phases of operations. It is moving in the right direction of providing a fully networked

battle command capabilities bridge from the Current to Future Force and enables interdependent network-centric operations with unprecedented situational awareness,” Greene explained.

ABCS consists of 11 command and control (C2) systems interoperating together with supporting infrastructure to provide a single C2. Thus, ABCS is often called a system-of-systems (SoS). Systems within ABCS support Soldiers specializing in battlefield functional areas such as fire support, logistics or intelligence. Each battlefield functional area system aids in planning, coordinating and executing operations by providing access to information from the network accompanied by computer-automated support.

Prior to 1995, several independent projects tried to leverage the rapid growth in Internet-related technologies by developing systems that could improve capabilities in battlefield functional areas. ABCS evolved from an effort to join those developing systems into an SoS where the systems are further developed and networked using communications equipment to allow information sharing among all operating systems.

The ABCS systems engineer, PEO C3T, headquartered at Fort Monmouth, began working with the U.S. Army Training and Doctrine Command and elements of the 4ID at Fort Hood to develop ABCS in 1995. Development continued with designated units in III Corps and the SBCTs. Development and maturation of ABCS had been scheduled to continue, but only within the so-called digital units.

“We had planned to test ABCS Versions 7, 8 and 9 starting in October 2002,” Greene said. “Then we got caught up in *Operation Iraqi Freedom (OIF)*. Now, we’ve shifted our focus from developing ABCS in just the elite, ‘digital’ units, to fielding a good capability to the whole Army as soon as possible,” Greene commented.

Much of the development effort behind ABCS 6.4 was focused on improving interoperability between the different ABCS and on applying lessons learned about digital battle command from operations in Iraq. Just months before combat operations commenced in Iraq, units designated to deploy either had ABCS already, had existing digital capabilities or had



Software engineers Stephen Pinizzotto (left) and Edward Dooley examine a display of Maneuver Control System Version 6.4 spread across two monitors at the Software Engineering Center, Fort Monmouth, NJ. The engineers were preparing the computer code to be sent to the Central Technical Support Facility at Fort Hood, TX, for testing MCS within ABCS. (U.S. Army photo.)

digital battle command systems added or updated to join in the confederation of systems under the Coalition Forces Land Component Command.

"The systems weren't all interoperable, but we made it work," Greene exclaimed. "The systems used during *OIF* were tested together at the CTSF prior to deployment in a manner similar to how ABCS 6.4 will be tested."

To conduct the tests, a realistic ABCS network model was set up in a facility at the CTSF and simulations of actual operations were run through the various systems. The simulations were fed slowly at first and then at increasingly higher rates. When glitches were found, onsite development/technical staffs developed solutions on-the-spot. The process continues in what is called a 'test-fix-test cycle' until the system proves highly stable.

The CTSF places Soldiers, the requirements community, material developers, product managers, industry, software programmers, engineers, technicians, the test community, trainers and systems in

one facility so the cycle can continue with all the necessary support on hand. The biggest difference between previous ABCS versions and ABCS 6.4 is that, comparatively, Version 6.4 is much easier to set up and configure so that its battlefield functional area systems will interoperate. "A lot of times the interoperability was there, but because Soldiers couldn't set it up, they said the interoperability didn't work," Wortman reflected.

ABCS Version 6.4 will also have an important new feature called the ABCS Information Services (AIS) Server, which provides a publish-and-subscribe capability with state-of-the-art enabling technologies commonly used on the commercial Internet. AIS will make ABCS 6.4 network centric and user-friendly, allowing for greater horizontal integration among ABCS and interoperability outside the Army. This opens the door for interoperability with the other services and with coalition forces. Publish-and-subscribe services also begin the migration to network-centric battle command. "An important aspect of digital battle

command is called the common operational picture," Wortman explained. "It is formed with all the information about the changing conditions of operations that is shared on the ABCS network using publish-and-subscribe services.

"Since the ABCS network holds much more information than any one decision maker actually needs to function, a mechanism is required that allows users to access the information they need and to have it provided automatically," Wortman acknowledged. "With the new feature, users can subscribe to a particular area of interest, and the system will automatically send any new related information," Wortman concluded.

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ABCS 6.4 Network Battlefield Functional Area Systems

Advanced Field Artillery Tactical Data System (AFATDS). Plans and controls fires and effects.

Air and Missile Defense Workstation (AMDWS). Used for planning, control and execution of air and missile defense.

All Source Analysis System (ASAS). Used for intelligence operations and analysis, it places battlefield intelligence from Soldiers and sensors on the same network.

Battle Command Sustainment Support System (BCS3). Provides logistics and supply information for planning and control.

Digital Topographic Support System (DTSS). Used for terrain mapping and analysis.

Force XXI Battle Command Brigade-and-Below and Blue Force Tracking (FBCB2 and BFT). Provides maneuver planning below brigade level and situational awareness for the entire theater.

Global Command and Control System – Army (GCCS-A). This is the Army's strategic and theater command and control system and Army interface to Joint systems, division and above.

Integrated Meteorological System (IMETS). Provides for weather analysis.

Integrated System Control (ISYSCON). Provides for communications system network management, control and planning.

Maneuver Control System (MCS). Supports command staff in planning, preparation and execution of battle from corps to battalion.

Tactical Airspace Integration System (TAIS). Provides airspace planning, control and deconfliction.